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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/723,292	11/28/2000	Satoshi Kajiya	2611-0136P	5509

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EXAMINER	
CHAN, ALEX H	

ART UNIT	PAPER NUMBER
2633	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/723,292	Applicant(s) KAJIYA ET AL.	
	Examiner Alex H Chan	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *11-25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. Amendment filed on December 5th, 2003 is herein acknowledged.

2. Newly submitted **claims 11-25** directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: While **claims 1-10** combine to recite a second fiber having a zero dispersion different from the first fiber, **claim 11** claims "the output WDM signal is such that a SPM-GVD effect and FWM are minimized relative to an output zero-dispersion wavelength," which are not required or stated in **claims 1-10**. Therefore, **claims 11-25** are independent and patentably distinct from the invention originally claimed.

3. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, **claims 11-25** are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on November 14th, 2003 was filed after the mailing date of the first Office Action on August 3rd, 2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure

statement is being considered by the Examiner except U.S. 6,115,173 to Tanaka et al because it has already been cited and considered in the previous office action.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claim 1** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent No. 6,188,823 B1 to Ma in view of U.S. Patent No. 6,115,173 to Tanaka et al (hereinafter Tanaka).

Regarding claim 1, Ma discloses an optical wavelength division multiplexing (Col. 2, lines 65-67) transmission system (Fig. 4) comprising: a first optical fiber transmission path (402) for wavelength division multiplexed (WDM) signal to be input therefrom; a second optical fiber transmission path (404) having a zero-dispersion wavelength different from the first optical fiber transmission path (Col.1, lines 38-44); and an optical repeater (43) which receives the wavelength division multiplexed signal from said first optical fiber transmission path. Ma does not disclose wavelength-converts the received signal with respect to respective wavelengths thereof, and outputs the wavelength-converted signal to said second optical fiber transmission path. Tanaka discloses an optical repeater (Col. 3, lines 48-50) wavelength-converts (20 and 22 of Fig. 1a) the received signal (e.g. from 16-1 of Fig. 1a) with respect to respective wavelengths thereof, and outputs the wavelength-converted signal to said second optical fiber transmission

path (e.g. to 16-2 of Fig. 1a). Accordingly, one of the ordinary skilled in the art would have been motivated to employ the above wavelength converting means for providing an optical amplifying transmission system and an optical amplifier that can obtain satisfactory transmission characteristics in a WDM transmission (Col. 1, lines 59-63). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the optical communication system of Ma by incorporating the above means because this provides satisfactory transmission characteristics in a WDM transmission as taught by Tanaka.

Regarding claim 2, Tanaka discloses an optical repeater is configured to shift (Col. 3, lines 39-67), by a predetermined value (Col. 10, lines 42- 51), all wavelengths of the WDM signal.

Regarding claim 5, Tanaka discloses an optical repeater configured for wavelength intervals of the WDM signal input from first optical fiber transmission path to be a constant value $\Delta\lambda$ (e.g. Col. 5, lines 51-57) and for wavelength intervals of the wavelength division multiplex signal output to second optical fiber transmission path to be a constant value $\Delta\lambda'$ (e.g. Col. 5, lines 42-51).

Regarding claim 7, Tanaka discloses the optical repeater of the optical WDM transmission system be comprised of a non-linear element that performs the wavelength conversion (Col. 5, lines 25-30).

Regarding claim 8, Tanaka discloses an optical repeater comprised of one or more semiconductor optical amplifiers (Col. 5, lines 26-33).

Regarding claim 9, Tanaka discloses an optical repeater comprised of one or more electric field absorption type optical modulators and one or more light sources (Col. 3, lines 29-30).

Regarding claim 10, Ma discloses an optical repeater comprises one or more light sources (via 101 of Fig. 3) and an optical fiber having a non-linear optical effect (Col. 1, lines 15-18).

7. **Claims 3 and 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma in view of Tanaka as applied to claim 1 above, and further in view of U.S Patent No. 6,118,561 to Maki.

Regarding claim 3, Ma in view of Tanaka fails to disclose an optical repeater that is configured for wavelength intervals of the WDM signal input from the first fiber transmission

path to be in even intervals and for wavelength intervals of the WDM signal output to the second fiber transmission path to be in uneven intervals.

Maki discloses an optical repeater that is configured for wavelength intervals of the WDM signal input from the first fiber transmission path to be in even intervals and for wavelength intervals of the WDM signal output to the second fiber transmission path to be in uneven intervals (Col. 7, lines 40-48). Accordingly, one of the ordinary skilled in the art would have been motivated to make such a modification in view of the suggestion in order to construct an unequally spaced arrangement of optical wavelengths that can be realized readily and economically to suppress unwanted four-wave mixing. Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to modify the optical communication system of Ma in view of Tanaka to configure the input with even wavelength intervals and output with uneven wavelength intervals because this provides to construct an unequally spaced arrangement of optical wavelengths that can be realized readily and economically to suppress unwanted four-wave mixing as suggested by Maki.

Regarding claim 4, Maki discloses an optical repeater that is configured for wavelength intervals of the WDM signal input from the first fiber transmission path to be uneven intervals and for wavelength intervals of the wavelength division multiplex signal output to the second fiber transmission path to be even intervals (Col. 2, lines 7-18).

8. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma in view of Tanaka as applied to claim 1 above, and further in view of U.S Patent No. 5,438,445 to Nakano.

Regarding claim 6, Ma in view of Tanaka fails to discloses an optical repeater that is configured for a number of wavelengths of the WDM signal inputting to the optical fiber to be a natural number "n" and for a number of wavelengths of the WDM signal outputting to the optical fiber to be a natural number "m" where "n" is different from "m." Nakano discloses an optical repeater that is configured for a number of wavelengths of the WDM signal inputting to the optical fiber to be a natural number "n" and for a number of wavelengths of the WDM signal outputting to the optical fiber to be a natural number "m" where "n" is different from "m" (e.g. a total number of 12 optical signals of wavelengths enters the wavelength-converting device and only a total number of 6 optical signals of wavelengths exits the wavelength-converting device, Fig. 2 and Col.8, lines 13-33). One of artisan would have been motivated to employ the above means for removing useless optical signals of wavelengths that have already been received by the optical wavelength multiplexing add/drop or other optical repeaters apparatuses. Therefore, it would have been obvious to one ordinary skill in the art to modify the optical communication system of Ma in view of Tanaka by incorporating the above means for the purpose of removing useless optical signals of wavelengths that have already been received by the optical wavelength multiplexing add/drop or other optical repeaters apparatuses as taught by Nakano.

Response to Arguments

9. Applicant's arguments, see Remarks starting on page 25, filed on December 5th, 2003, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further

consideration, a new ground(s) of rejection is made in view of U.S. Patent No. 6,188,823 B1 to Ma as discussed above.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Suemura et al (Fig. 12), Huber et al (USP. 5,629,994 and Fig. 1), Sharma et al (Fig. 15), Leclerc et al (Fig. 4-5), Huber et al (USP. 6,005,698 and Fig. 1), Tanaka et al (USP. 5,657,144 and Fig. 18) and Horlyck (Fig. 4) are cited to show wavelength converting means along with optical splitter(s) (i.e. demultiplexer(s)), wavelength selector(s), and multiplexer(s).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan
Patent Examiner, AU 2633
January 20th, 2004

JASON CHAN
SUPERVISORY PATENT EXAMINER
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